

REVIEW ARTICLE

Herpes Zoster: Pain Management With Lidocaine Alkaline Emulsion

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ABSTRACT

Shingles, caused by the Zoster virus, is manifested by a local lesion of the skin and mucous membranes, which are very inflamed, covered with a herpetic rash and severely torment the victims with local pain. Other symptoms of the disease are itching, burning, local hyperemia and local hyperthermia. As a rule, a herpetic rash occupies a large area on the surface of the patient's body. Often, the lesion zone has the form of a wide band that is localized on the back, stomach and both sides of the body, namely, in the place where the belt from the trousers and/or the belt from the dress is usually located. Traditional treatment for this skin disease includes "skin" medications such as skin creams and skin ointments that contain antihistamines, steroid anti-inflammatory medications, and antiviral medications. However, these drugs are not highly effective, so despite treatment, the disease torments patients. In recent years, a new drug has been proposed for emergency treatment of patients suffering from severe excruciating pain. This new drug is a alkaline cream-milk containing a local anesthetic that easily penetrates the skin and mucous membranes. The article provides a prescription for a new drug.

Key words: herpes Zoster, shingles, rash, local inflammation, pain, lidocaine.

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Irrigation of the area of herpetic rashes with a lidocaine alkaline emulsion is a highly effective and safe way to urgently eliminate acute pain in shingles.

INTRODUCTION

Shingles or herpes Zoster (HZ) is a common disease that to affect the skin and mucous membranes [1, 2]. HZ is caused by reactivation of latent chickenpox virus (VZV). This infectious disease usually manifests as unilateral grouped herpetiform vesicles developing erythematous base, known as herpes rash [3]. HZ characterized by a painful vesicular rash in the affected dermatome [4, 5].

Shingles is manifested by local inflammation of the skin and mucous membranes. In this case, the area of inflammation looks like a wide band of herpetic rash. Severe pain, itching and burning in the area of inflammation strongly and long torment patients. In addition, the appearance of local hyperemia and local hyperthermia is characteristic. However, it is severe pain that causes terrible suffering in patients.⁵This disease usually affects elderly people with weakened immunity [2]. At the same time this typical rash is usually preceded by fever, dermatomal pain and regional lymphadenopathy [6].

Treatment of shingles consists mainly of steroid anti-inflammatory drugs, antihistamines, antiviral therapy, and pain relief [2, 7]. It is considered that shingles is self-limiting, but sometimes it can cause a number of complications, such as postherpetic neuralgia, ophthalmic shingles, and secondary infections.^{8,9}Sometimes the disease affects various organs, such as the gastrointestinal tract, genitourinary tract, ENT organs, and even the central nervous system.¹⁰As a rule, a herpetic rash occupies a large area on the surface of the patient's body. Often, the lesion zone has the form of a wide band that is

localized on the back, stomach and both sides of the body, namely, in the place where the belt from the trousers and/or the belt from the dress is usually located.²Traditional treatment for this skin disease includes "skin" medications such as skin creams and skin ointments that contain antihistamines, steroid anti-inflammatory medications, and antiviral medications [2]. However, these drugs are not highly effective, so despite treatment, the disease torments patients [11].

Often a very strong feeling of pain with shingles deprives the patient of sleep for several days. Insomnia due to severe pain very much torments patients. That is why the use of even epidural anesthesia is justified to eliminate pain and restore sleep [11].

However, epidural blockage requires special skills, conditions, and medications. It itself is a threat to the health to patients. In this regard, it is necessary to find a safer method of treatment.

This article aims to show more clearly the pathogenesis of pain that occurs in the skin when its inflammation is caused by shingles, and to justify the use of a legendary group of local anesthetics for terminal anesthesia.

KNOWN METHODS OF TREATMENT WITH ANTIVIRAL, ANTI-INFLAMMATORY, PAINKILLERS AND ANTIHISTAMINES

For a long time, to justify the correctness of treatment of patients suffering from shingles, specialists relied on the etiology of the disease, namely, that it has an infectious nature [2, 12]. Therefore, for a long time, the basis of therapy were the anti-infectious drugs, namely, antiviral drugs [2, 13]. The specialists were convinced that antiviral drugs, on the one hand, should reduce the severity of the feeling of pain and on the other hand shorten the recovery time of the disease caused by the Zoster virus. However, the results of clinical use of these drugs refute these claims [14].

In parallel, many believed that pain in the skin and mucous membranes when affected by the herpes virus occurs due to their inflammation. Therefore, many believed that known anti-inflammatory drugs, especially corticosteroids, should also reduce acute pain. It turned out that there is no convincing evidence of the effectiveness of steroid anti-inflammatory drugs [15]. Known antihistamines and antiallergic agents are also not effective for acute pain that torments patients with shingles [16-18]. Over-the-counter nonsteroidal anti-inflammatory drugs, in particular paracetamol, are also not a reliable painkiller for HZ [19].

On the other hand, opioids effectively eliminate any acute pain [20]. But the practice of their application has shown that medical pain management is in crisis: from the pervasiveness of pain to inadequate pain treatment, from the escalation of prescription opioids to an epidemic in addiction, diversion and overdose deaths. The rising costs of pain care and managing adverse effects of that care have prompted action from state and federal agencies including the DOD, VHA, NIH, FDA and CDC [21]. Various poultices, lotions, compresses and other folk medicine also do not reliably reduce the feeling of pain in shingles. In addition, known nonpharmacological means are also not able to eliminate acute pain and replace opioids [20]. It is believed that the following home remedies for shingles can alleviate suffering: essential oils, Cool baths, Oat baths, Gentiana Scabra and vitamin supplements [22]. But, there is no convincing scientific data that reliably confirms the analgesic effect of folk remedies.

Therefore, we can say that today official medicine does not have effective and safe medicines to eliminate acute pain in shingles.

TERMINAL ANESTHESIA WITH LIDOCAINE ALKALINE EMULSIONS A WAY TO ELIMINATE ACUTE PAIN

In recent years, it has been reported that if the effectiveness of all the above drugs is low, a nerve block can be performed, in particular an epidural nerve block [11]. In addition, to combat acute pain, a multimodal analgesic treatment regimen was recommended, including local lidocaine and capsaicin (a cannaboid receptor agonist), systemic therapy and interventional therapies. In particular, lidocaine and capsaicin patches were recommended to reduce acute pain [4].

However, epidural anesthesia is very difficult to perform even in a medical facility and this procedure is very dangerous for the patient's health, and the patch is not convenient and safe enough to apply to the area of herpetic rash. The fact is that initially the patch does not have the "right" size and "right" shape. Therefore, each patient is forced to independently cut out a patch of the desired size and shape each time. In addition, the patch itself has a local irritating effect and increases acute pain with shingles. In addition, the patch adheres strongly to the skin, so the patch is then very difficult to remove from the skin. At the same time, during the removal of the patch, a repeated local irritating effect may occur and this may increase the acute pain in the rash area, and sometimes may cause local bleeding.

Therefore, a new very effective and safe method of using lidocaine for emergency treatment of patients suffering from severe acute pain with shingles has been proposed in Russia. The new method is based on the external application of lidocaine hydrochloride alkaline emulsion.²³ The essence of the invented cream-milk containing an oil phase, structure-forming emulsifiers and an aqueous phase with lidocaine hydrochloride and an emollient agent is that sodium hydrogen carbonate is used as the emollient agent, and the aqueous phase is a solution of 1.0 - 1.2% lidocaine hydrochloride and 0.45% sodium hydrogen carbonate at a pH of 8.4 and an osmotic activity of less than 280 mosmol/l of water. Invention is a cream milk for the immediate relief of pain in the area of skin eruptions in the form of watery blisters arising during zoster.

The proposed composition of components and the ratio of their concentration in an aqueous solution at an alkalinity with a pH of 8.4 and osmotic activity of less than 280 mosmol/l of water are optimal for softening crusts and clots of serous fluid, pus and/or blood that cover the skin in the area of the rash of watery blisters, and to ensure rapid penetration of lidocaine hydrochloride into the skin, and then for absorption of lidocaine into the blood. Lidocaine eliminates pain in an inflamed area of the skin due to local anesthesia and reduces psychoemotional tension and insomnia due to general sedative and hypnotic effects after absorption into the blood.

The total concentration of ingredients in the solution provides it with an osmotic activity of 242-272 mosmol/l of water. In particular, the presence of 1.0-1.2% lidocaine hydrochloride in the proposed water solution provides the basic osmotic activity of the solution within the range of 160-200 mosmol/l of water. The presence of 0.45% sodium hydrogen carbonate in the solution increases its osmotic activity by another 72 mosmol/l of water. Therefore, the solution has an osmotic activity of 242-272 mosmol/l of water, that is, it has less osmotic activity than the osmotic activity of plasma and human intercellular fluid normally (280-300 m/Osmol/l of water). In addition, the presence of 0.45% sodium bicarbonate in the proposed solution provides optimal alkalinity of the solution within the pH range of 8.4 in the presence of buffer properties. This buffer and alkaline activity is sufficient to effectively dissolve thick pus and blood clots, which also eliminates alkaline burn [24, 25].

At the same time, sodium hydrogen carbonate is identical to the main component of the alkaline hydrogen carbonate buffer contained in human blood plasma in normal conditions. Therefore, liquid cream-milk is safe. An aqueous solution of 1.0-1.2% lidocaine hydrochloride has a good penetrating activity, so it quickly penetrates through the softened tissue covering the skin and through the skin itself, after which it is quickly absorbed into the blood. The proposed range of lidocaine hydrochloride concentration provides the drug with effective surface anesthesia and general sedation, which reduces the feeling of pain and restores sleep in the absence of toxic effects. Moreover, solutions of 1-2% lidocaine hydrochloride are traditionally used for terminal anesthesia in medical practice, in particular, for applications. At the same time, the ingredients that make up the cream-milk are in it in doses and concentrations that exclude poisoning of a person with the general effect.

The developed product when applied to the skin acts as follows: it has an enveloping and softening effect, quickly liquefies dry crusts, thick serous liquid, thick pus and blood crusts, and facilitates their painless removal from the surface. At the same time, the drug promotes the formation of a uniform film on the skin surface, which protects the skin from drying out and irritation, makes it soft and elastic, reduces the amount of interstitial pressure, accelerates the penetration of lidocaine into the skin and the absorption of lidocaine into the blood. At the same time, the drug reduces not only local pain, but also reduces local hyperemia, local hyperthermia and swelling in the area of herpetic rash [23].

Therefore, when applied to the skin in the area of herpetic rash, the new drug eliminates all the symptoms of local inflammation, namely, swelling, soreness, hyperemia and hyperthermia due to terminal anesthesia.

It is very important that the new drug provides urgent terminal anesthesia, which immediately eliminates acute pain, and then after 5 to 10 minutes, the drug has a general sedative effect, which eliminates neurosis and restores sleep.

The developed remedy that eliminates the feeling of pain in the area of the skin affected by watery blisters with shingles can be used for painless skin applications. For this purpose, the liquid cream-milk is applied to the area of skin rash carefully and carefully using a soft spatula. The fact is that the liquid cream-milk is a liquid emulsion of the oil/water type and its consistency resembles milk. Therefore, it is very convenient to use: it is applied to the skin of the affected area with a light touch and evenly, without additional effort, distributed over it. Cream-milk promotes the formation of a uniform layer on the surface of the skin, which as an enveloping substance protects the skin from drying out, makes it soft and elastic. Application of the proposed cream-milk to the skin in the area of skin rash with shingles quickly dilutes dry crusts, thick pus, thick serous fluid and blood, facilitates their painless removal from the surface,

facilitates the penetration of the main active substance into the tissue and its absorption into the blood. This ensures high speed and efficiency of eliminating the feeling of pain in the area of skin rash, neurosis symptoms and restoring sleep. Sleep, in turn, increases and extends the analgesic effect, since sleep provides general anesthesia.

In the materials of the invention under consideration, it is indicated that clinical observations were made on healthy volunteers aged 21-23 years, in which flap tests and tests of applying an alkaline lidocaine emulsion were applied. The results of observations showed that the cream-milk is harmless, does not have an irritating and allergizing effect [23].

In the description of this invention, it is indicated that in the summer of 2016, a clinical observation was conducted on a woman S. at the age of 62 years, who suddenly became ill with shingles and had a lot of watery blisters of different sizes on the skin of the lower back and both sides of the abdomen. In this case, the affected area looked like a solid belt 10 – 15 cm wide, consisting of close-to-each-other watery blisters and ring-shaped areas of skin hyperemia around the base of each bubble. The affected area caused severe pain, which was increased by any touch to the area of inflammation and, in particular, acute pain occurred and increased from contact with clothing and sheets. The unfortunate woman could not lie on her back or on her side, so she was in a sitting position, but she did not sleep for 2 days.

To treat shingles and eliminate acute pain, well-known medications (antiviral, antihistamine, antiprostaglandin, steroid anti-inflammatory agents, 10% lidocaine hydrochloride spray) and folk remedies (lotions, compresses and poultices with extracts of medicinal plants) were consistently applied. However, no known means has not eliminated the acute pain and restored sleep.

After that, a new tool was applied, namely, an alkaline emulsion of 2% lidocaine hydrochloride. After the first application of the product to the area of herpetic rash, the feeling of acute pain began to decrease significantly after 20-40 seconds, and after 3 minutes, the pain disappeared almost completely over the entire area of inflammation. At the same time, the hyperemia decreased and the woman's nervous excitement disappeared. 7 minutes after the first application of the product, the woman fell asleep sitting in bed. Her sleep lasted about 6 hours. After she woke up, an alkaline emulsion of 2% lidocaine hydrochloride was applied repeatedly to the area of inflammation. Repeated application of the product again eliminated the acute pain and so the woman fell asleep again. The dream lasted several hours. The woman then applied the new medication to the affected area on her own every time she woke up. Moreover, a day after the start of the course of treatment with the invented tool, the woman was able to lie on her right side and was able to sleep lying on her right side. And so successfully she used this tool on her own for several days, until the rash and local pain disappeared [23].

CONCLUSION

A review of scientific and patent literature has shown that acute pain, which greatly torments patients with shingles, is not eliminated by antiviral, antihistamine, non-steroidal and steroid (corticosteroid) anti-inflammatory agents. This pain can only be overcome with opioid medications (unfortunately, dangerous for the development of drug addiction), epidural anesthesia (unfortunately, a complex and dangerous injection), a skin patch with lidocaine hydrochloride or capsaicin (unfortunately, dangerous for local mechanical damage) and an application of an alkaline emulsion of 2% lidocaine hydrochloride. Moreover, it is most likely that cream-milk with lidocaine may be the most promising "skin" treatment for HZ. The fact is that this drug is a liquid cream that, when applied once to the affected area, very quickly and reliably eliminates all the symptoms of inflammation, namely, local pain, redness, hyperthermia, swelling and impaired function of the inflamed area.

Further modernization of liquid cream with lidocaine is worthy of attention of various specialists involved in the development of new drugs and treatment of HZ. The development of a special liquid cream for the treatment of herpetic rash is a promising and realistic goal that can be achieved in the near future, and advances in this field of pharmacy and dermatology can increase the effectiveness, safety of treatment of HZ and reduce the cost of treatment of patients with shingles.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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